SECURITY CLASSIFICATION OF THIS PAGE

DTIC FILE COPY

REPORT DOCUMENTATION PAGE

(2)

1a REPORT SECURITY CLASSIFICATION UNCLASSIFIED	1b RESTRICTIVE MARKINGS
2a SECURITY CLASSIFICATION AUTHORITY	3 DISTRIBUTION / AVAILABILITY OF REPORT Approved for public release; distribution unlimited.
AD-A196 592	5 MONITORING ORGANIZATION REPORT NUMBER(S) AFOSR-TR- 88-0336

6a NAME OF PERFORMING ORGANIZATION University of California College of Medicine	6b OFFICE SYMBOL (If applicable)	7a NAME OF MONITORING ORGANIZATION Air Force Office of Scientific Research/NL	
6c ADDRESS (City, State, and ZIP Code) Department of Pharmacology Irvine, CA 92717		7b ADDRESS (City, State, and ZIP Code) Building 410 Bolling AFB, DC 20332-6448	
8a NAME OF FUNDING / SPONSORING ORGANIZATION AFOSR	8b OFFICE SYMBOL (If applicable) NL	9 PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER AFOSR-87-0019	
8c ADDRESS (City, State, and ZIP Code) Building 410 Bolling AFB, DC 20332-6448		10 SOURCE OF FUNDING NUMBERS PROGRAM ELEMENT NO: 61102F PROJECT NO: 2917 TASK NO: A4 WORK UNIT ACCESSION NO:	

11 TITLE (Include Security Classification)
Neuronal Mechanisms of Intelligence

12 PERSONAL AUTHOR(S)
Larry Stein

13a TYPE OF REPORT Final	13b TIME COVERED FROM 1 10 86 TO 30 9 87	14 DATE OF REPORT (Year, Month, Day) 88 Mar 04	15 PAGE COUNT 1

16 SUPPLEMENTARY NOTATION

17 COSATI CODES			18 SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB-GROUP	operant conditioning; positive reinforcement; reward; learning; adaptive networks; self-stimulation

19 ABSTRACT (Continue on reverse if necessary and identify by block number)

Data collection and analysis eqipment were purchased to support research on operant conditioning in single neurons and behaving rodents. The equipment was installed and is fully operational.

20 DISTRIBUTION / AVAILABILITY OF ABSTRACT ☒ UNCLASSIFIED/UNLIMITED ☒ SAME AS RPT ☐ DTIC USERS	21 ABSTRACT SECURITY CLASSIFICATION UNCLASSIFIED
22a NAME OF RESPONSIBLE INDIVIDUAL WILLIAM O. BERRY	22b TELEPHONE (Include Area Code) (202) 767-5021
	22c OFFICE SYMBOL NL

DD FORM 1473, 84 MAR 83 APR edition may be used until exhausted. All other editions are obsolete.

SECURITY CLASSIFICATION OF THIS PAGE
UNCLASSIFIED

87-0019

Final Scientific Report for AFOSR Grant No. 84-0325 November 1987

1. Equipment Acquired.

The following list describes all equipment actually acquired by name, manufacturer and cost. The purchased equipment was identical to that requested in our final revised equipment listed dated May 22, 1987. An alternative system with greater capability and similar price was substituted for the requested Tektronix System because the vendor was unable to provide the necessary software.

Item Purchased	Manufacturer	Cost
7 PS/2 Computer Systems	IBM	13,517
1 8-Stimulation Interface	Coulbourn	27,460
10 Model E17-72 Stimulation Isolators	Coulbourn	15,129
5 Oscilloscopes	Tektronics	6,501
	Total Expense	62,607
	Cost Sharing	(12,521)
	Grant Expenditure	**$50,086**

2. Equipment Usage.

All equipment has been used for on-line experimental control, data collection, and data analysis functions. In this work, we are investigating the adaptive rules used by mammalian brain cells in the mediation of intelligent behavior. The research is based on the assumption that human intelligence has evolved from the goal-seeking brain functions of lower forms, and that these functions in turn depend on a capacity for behavior to be strengthened or rewarded by its consequences (positive reinforcement). We furthermore assume that positive reinforcement of the intact organism is physiologically mediated at the level of the single neuron, rather than at the level of the multi-neuronal assembly or network. The equipment is being used in the performance of experiments designed to investigate whether individual cellular activity can be reinforced by locally applied electrical or chemical stimulation, and, if so, to establish the physioloical and biochemical properties of such cellular reinforcements. Experiments are being conducted on single neurons in cell culture, brain tissue slices, and intact brain. The instrumentation enabled us to investigate modification of ionic channels and cellular biochemistry related to reinforcement. In addition, the equipment was used for detailed data analysis and computer modeling.

3. Personnel.

Following is a list of all personnel who have used the equipment:

Larry Stein, Ph.D.	PI
James Belluzzi, Ph.D.	Co-PI
Alan Fairhurst, Ph.D.	Professor
Frances Leslie, Ph.D.	Associate Professor
Charles Gorenstein, Ph.D.	Assistant Professor
Andrej Rotter, Ph.D.	Assistant Professor
Joel Black	Graduate Student
Karen Stevens	Graduate Student
David Self	Graduate Student
Diana Hurlbut	Graduate Student
Giochi Shiotsu	Student
Jennifer Wang	Student

A-1